

**Ash Meadows National Wildlife Refuge  
August 2000 WildFire  
Emergency Fire Rehabilitation Plan**

**Submitted By:** \_\_\_\_\_  
**Project Leader**

**Date:** \_\_\_\_\_

**Reviewed By:** \_\_\_\_\_  
**Zone Fire Management Officer**

**Date:** \_\_\_\_\_

**Concurs:** \_\_\_\_\_  
**Regional Fire Management Coordinator**

**Date:** \_\_\_\_\_

**Concurs:** \_\_\_\_\_  
**Regional Chief, NWRS**

**Date:** \_\_\_\_\_

**Approved By:** \_\_\_\_\_  
**California/Nevada Operations Mgr**

**Date:** \_\_\_\_\_

## BACKGROUND

On August 4<sup>th</sup>, 2000, at approximately 0930 hours, a lightning strike started a wildfire at Ash Meadows National Wildlife Refuge (NWR). The Fire was reported by civilians to the Nye County Sheriff's Office and the Bureau of Land Management (BLM). BLM fire crews arrived on scene at approximately 1100 hours. At that time, the fire was slowly burning outward from a one acre area southwest of Longstreet Spring. Southwesterly winds rapidly pushed the fire to the north and northwest before the BLM crew could stop it. By late afternoon, the fire had burned 1.5 miles northward through mesquite and saltcedar woodlands, meadows, and cattail marshes before running out of fuel in the open Mojave desert scrub at the north end of the refuge (Figures 1 and 2). The fire continued to burn throughout the night of August 4<sup>th</sup>, slowly backing into the prevailing southwesterly winds and burning dense stands of saltcedar and mesquite. The fire was considered contained on the afternoon of August 5<sup>th</sup>, but fire crews continued to put out hot spots through August 7<sup>th</sup>. The fire covered approximately 753 acres, including 658 acres of FWS lands, 55 acres of BLM lands, and a 40 acre private tract owned by The Nature Conservancy (Figure 1).

## REFUGE HISTORY

Ash Meadows NWR was established on June 18<sup>th</sup>, 1984 with the purchase of 12,654 acres from The Nature Conservancy. An additional 9,463 acres of BLM lands within Ash Meadows NWR is cooperatively managed by the refuge.

Ash Meadows NWR is located in the Amargosa Valley, Nye Co., Nevada, 90 miles NW of Las Vegas. The elevation of Ash Meadows ranges from 1,900 to 3,600 feet. The refuge is essentially a wetland oases, surrounded by a vast area of dry Mojave Desert. This isolated and unique wetland ecosystem is home to at least 24 unique species. This concentration of indigenous life distinguishes Ash Meadows as having the greatest concentration of endemic species in the United States, and second in all of North America. Twelve of these endemic species are listed as Threatened or Endangered. In addition, the federally endangered Southwestern willow flycatcher (*Empidonax trailii eximius*) is found at Ash Meadows. Recent surveys have estimated five or six breeding pairs nesting on the refuge during the months of June and July.

The refuge is a major discharge point for a vast underground water system stretching over 100 miles to the northeast. Nearly all of the water at the refuge is "fossil" water, believed to have entered the ground water system thousands of years ago. Water bearing strata comes to the surface in more than 30 seeps and springs, providing a rich and complex variety of habitats. More than 332 plant species are found within Ash Meadows NWR. A creosote bush (*Larrea tridentata*) vegetation community predominates in the surrounding region. The spring feed riparian habitats are dominated by screw bean mesquite (*Prosopis pubescens*), honey mesquite (*P. Glandulosa torreyana*), leather-leaf ash (*Fraxinus velutina*), narrow-leaved willow (*Salix exigua*) and Emory baccharis (*Baccharis emoryi*). Dry upland habitats are dominated by eight saltbush (*Atriplex*) species. Annual rainfall averages less than 2.75 inches with evaporation exceeding 98.50 inches. Clay soils dominate most of the refuge on the valley floors. Gravelly alluvial fans extend out from the low limestone hills along the east side of the refuge (Figure 3).

The water at Ash Meadows has lured man since prehistoric times. Shoshone Indians occupied the area to take advantage of its water and food. Many areas immediately adjacent to springs and along outflow channels were granted to private ownership when Nevada gained its statehood in 1864. During the 1960's and 70's, springs and streams were extensively altered and diverted. Thousands of acres which were leveled adjacent to springs for alfalfa and other intensively farmed crops. In the late 1970's the property was purchased by a large land developer and initial work began for planned housing tracts and golf courses. In an effort to prevent extinction of rare endemic species, The Nature Conservancy purchased 12,654 acres in 1984, which was sold to the Fish and Wildlife Service that same year.

The extensive habitat losses during the 1970's, caused the U.S. Fish and Wildlife Service, under emergency procedures, to list two fish and one plant as endangered and five plants and one aquatic insect as threatened. Two other fishes were previously listed as endangered in the early 1970's. The disturbance by farming also left thousands of acres of non-native weeds. Over 56 non-native plants have been introduced into the area. Of these, four are listed by the Nevada Department of Agricultural as noxious weeds: saltcedar (*Tamarix parviflora* and *T. ramosissima*), Russian knapweed (*Centaurea repens*), Johnson grass (*Sorghum halepense*) and hoary-cress (*Cardaria draba*).

## EVALUATION AND ANALYSIS

The fire burned approximately 753 acres, including 310 acres of riparian woodlands, 215 acres of wet and dry meadows, 55 acres of cattail-bullrush wetlands, and 170 acres of salt bush and desert scrub (Figures 2). Four perennial spring systems which release water into this area were affected; Longstreet, Rogers, Fairbanks and Soda Springs and their outflow channels. Combined, these springs release approximately 3500 gallons per minute.

Approximately 30 percent (225 acres) of the burn covered historical farm fields and peat mining areas, much of which are now dominated by saltcedar, Russian knapweed, and other noxious plants. In two areas, pure stands of saltcedar covering 45 acres were consumed, leaving large areas of exposed ground. Much of the remainder of the burn has sparse to moderate presence of saltcedar, Russian knapweed and other exotic vegetation. The fire also consumed a lot of the vegetation along the stream channels and around three of the spring pools, leaving these sites open to erosion, and invasion by exotic plants. Without preventative measures, these sites will become infested with weeds and saltcedar which will spread into outlying areas.

The majority of the fire burned hot, especially within riparian woodlands, where nearly all the grasses, forbs and shrubs were consumed above ground. Mesquite, saltcedar, ash and willow trees were generally reduced to black skeletons, but not affected below ground. Along the drier and sparser western edge of the burn, only 25%-50% of the trees were affected; most only lightly singed. Much of this are will need some measures to control the spread of non-native vegetation.

Two plants species federally listed as threatened, sustained losses from the fire; the Spring-loving Centaury (*Centaureum namophilum*) and Ash Meadows Gumplant (*Grindelia fraxino-pratensis*), both of which were flowering at the time. It is presently unknown what long term effects this fire will have on future germination and seeding of these plants. Subsequent monitoring of these species in and immediately adjacent to the burned area will provide this valuable information, and show the extent to which they are adapted to recover from future fire events.

There appears to have been no loss to the federally endangered Ash Meadows Pupfish (*Cyprinodon nevadensis mionectes*) found in these spring systems. Annual fish surveys will be conducted this fall and compared to populations recorded in previous years. Approximately 100 acres of potential flycatcher habitat, currently unoccupied, was burned.

No occupied buildings or structures were affected by the fire. Two other historic structures, Longstreet Cabin and a railroad tie cabin one half mile south of Fairbanks Spring were narrowly spared thanks to suppression efforts from helicopter water drops, fire engines wet lines, and hand crew lines.

## **REHABILITATION NEEDS AND OBJECTIVES**

The following needs and objectives have been identified for rehabilitation of the August 2000 wildfire at Ash Meadows NWR.

1. Reduce or eliminate wind and water erosion with emphasis on the springs.
2. Prevent the invasion of non-native plants, with emphasis on state listed noxious weeds; saltcedar and Russian knapweed in particular.
3. Monitor the success of chemical treatments, planting to determine the effectiveness of emergency fire rehabilitation.  
=====
4. Replace habitat lost for federally threatened Southwest Willow Flycatcher.
5. Monitor the recovery of federally listed Spring-loving Centaury and Ash Meadows Gumplant populations lost in the wildfire.
6. Monitor the recovery of other native plants and wildlife, compared with data collected in this area during the mid 90's.

## **Rehabilitation Alternatives:**

1. No Action Alternative.

Under this alternative, the burn area would be allowed to re-vegetate without management intervention. No action would be taken to minimize or control the proliferation of non-native plants, or to prevent soil erosion. No monitoring of the effects of erosion or the spread of non-native species, as a result of the fire, would occur.

## 2. Control Invasive Weeds, and Stabilization Soil (The Preferred Alternative)

Under this alternative, measures would be taken to control the spread of invasive species, and reduce wind and water erosion. This would be done by the use of herbicides, and planting of native trees and grasses.

Saltcedar and Russian knapweed within approximately 225 acres of the burned area would be chemically treated as they re-sprout from the roots. This will reduce the spread of these invasive weeds into other areas within the burn. Saltcedar and knapweed re-growth would be intensively treated with herbicide (Garlon 4) this fall, and again during the spring and summer of 2001 using backpack sprayers and a 50 gallon sprayer pulled by an ATV. Follow-up treatments during the spring and summer 2002 may also be needed. This fall, a ten person crew would be contracted through NPS's Southern Nevada Restoration Team (SNRT) to do short term intensive herbicide treatments of saltcedar and knapweed. Follow up treatments during the spring and summer of 2001 (and 2002) would be accomplished by a team of three temporary employees; two WG-5 seasonal workers for 20 months, and one Biological Technician (for two years). The Bio-Tech. would act at the crew boss, to ensure that work is done safely and effectively, and also be responsible for monitoring the effectiveness of burned area treatments over the two year period, and making any adaptive management corrections that may be needed.

In order to protect the burned area from erosion and further invasion from non-native weeds, native trees, shrubs and grasses would be planted in approximately 225 acres of the burned areas. Mesquite and ash seed collected at Ash Meadows would be ready for planting next fall. Planting would be concentrated within 42 acres of dense saltcedar, which will become largely devoid of vegetation after the herbicide treatments are complete. Planting would be less intensive within the remainder of the 225 acres. Nurseries would be contracted to grow mesquite and ash seedlings. Willow cuttings, treated with root toner, would also be planted along stream channels to replace habitat lost for the Southwestern willow flycatcher. Sod, plugs and/or seed of native grasses such as saltgrass (*Distichlis spicata*), alkali sacaton (*Sporobolus airoides*), and scratch grass (*Muhlenbergia asperifolia*) would be collected from unburned areas of the refuge by a sod machine, a heavy duty power mower and basket, and/or by hand. Seed of native shrubs would also be collected by hand. The nursery raised trees, as well as the shrub and grass seed and sod would be planted during the fall of 2001, and/or 2002, after the chemical treatments have been completed.

All of this seed collecting and planting would be very labor intensive. As with the herbicide treatments, the collecting/planting will be accomplished by the three person crew.

Monitoring sites will be established within and immediately adjacent to the burn area to evaluate and document the effectiveness of herbicide treatments and planting for the prevention of erosion and the spread of non-native vegetation.

## ENVIRONMENTAL CONSIDERATIONS

### 1. No Action Alternative.

Bare ground areas would be subject to wind and water erosion, and could become inundated by non-native weeds within a few years. Establishment of native vegetation would be reduced due to the spread of, and competition from, non-native weeds. Saltcedar will re-sprout from the roots of burned trees, and spread seed along opened streambanks creating expanded monotypic stands. Without preventative measures, much of the burned area could become infested with weeds and saltcedar in a short time.

Without follow-up monitoring, there would be no information on the effects of the fire, or the extent to which non-native vegetation spread as a result of the fire. This information would not then be available to guide actions during for future wildfire events.

### 2. Control Invasive Weeds, and Stabilization Soil (The Preferred Alternative)

Chemically treating saltcedar and Russian knapweed as it re-sprouts from the burned area will reduce, perhaps eliminate, the spread of these two extremely invasive species into previously unaffected areas within the burn. Chemical treatments would be carried out under the supervision of the Refuge Biologist who is a Certified Applicator, and has over five years experience doing this type of work. Obviously, extreme caution will be used to protect listed species, or other native fish, wildlife and plants.

Soil erosion would be minimized by seeding and planting native grasses and trees within exposed soils, especially where non-native plants have been treated and along open stream channels. This will stabilize the soils and further reduce the chance of non-native weed invasions.

This was the first major wildfire on Ash Meadows NWR since the area was acquired in 1984. Monitoring the success of rehabilitation efforts to determine the effectiveness of these treatments is key. Knowing the vegetation response to the fire, and success of the treatments and planting will provide critical adaptive management information to guide future fire management in this ecosystem.

## SUMMARY OF ANTICIPATED RESOURCE NEEDS AND COSTS

### 1. Labor needed for herbicide applications, collection of native grass seeds and planting.

10 person crew for four weeks (SNRT*)	\$20,000
2- GS 5 Seasonal employees for 20 months each	\$55,000
1- GS 7 Biological Technician for two years	<u>\$90,000</u>
Subtotal:	\$165,000

2. Chemical Treatment of Saltcedar and Russian Knapweed.

Herbicide Garlon four, 30 gallons at \$270.00 / 2.5 gallon	\$ 3,250
Cide-Kick II Spray Adjuvant 25 gallons, \$25/gallon	\$ 625
Backpack Sprayers x 4	\$ 660
55-Gallon Gasoline-Powered Sprayer	\$ 975
Personal Protective Equipment	<u>\$ 1,000</u>
Subtotal:	\$ 6,510

3. Trees and materials needed for Revegetation.

Nursery grown tree seedlings (from Ash Meadows seed)	\$ 3,400
Small equipment rental	\$ 3,500
Water Pump, shed and PVC pipe/fittings (for watering trees)	\$1,200
Drip line, fittings & sprinklers (for watering trees)	<u>\$ 1,000</u>
Subtotal:	\$ 9,100

4. Miscellaneous

Fuel	\$ 500
Supplies	<u>\$ 350</u>
Subtotal:	\$ 850

Total Cost: \$181,460

\* Southern Nevada Restoration Team.

**Amended Budget for Ash Meadows NWR  
Emergency Fire Rehabilitation Plan**

A need has arisen to adjust the funding within this project's budget line items. No additional funding is requested. Rather, we wish to reallocate the total amount within certain line items.

After the first year of the project's implementation additional information has been gained and a number of unforeseen events have arisen which necessitate line item adjustments. Labor costs will be less than expected, while the cost of herbicides is much greater than expected. Much of the projected labor was anticipated for grass and shrub revegetation; e.g. the hand collection of seed, and planting, watering and nurturing the planted areas. In fact much of the native grass and shrubs have re-grown on their own from existing unburned root mass and viable seed in the ground resulting in less need for labor intensive seed collecting and planting.

The control of exotic vegetation within the burned area remains one of the main objectives of the project. Due to a greater volume of exotic regrowth a much greater amount of herbicide is now needed. Original plans for extensive use of pumps and PVC pipe to irrigate planted areas are no longer needed. Some costs associated with the project were underestimated e.g. equipment needs and fuel costs.

1. Labor needed for herbicide applications, collection _____ of native grass seeds and planting.	ORIGINAL \$165,000	MODIFIED \$117,000
2. Chemical Treatment of Saltcedar and Russian Knapweed.	ORIGINAL \$6,510	MODIFIED \$ 56,500
3. Trees and materials needed for Revegetation.	ORIGINAL \$9,100	MODIFIED \$ 5,000
4. Fuel and Supplies	ORIGINAL \$ 850	MODIFIED \$ 2,500
	<u>TOTAL: ORIGINAL</u>	<u>MODIFIED</u>
	\$181,460	\$181,000

Prepared by: Eric Hopson, Refuge Manager

Date: December 20<sup>th</sup>, 2001

Submitted By: \_\_\_\_\_  
Project Leader

Date: \_\_\_\_\_

Concurs: \_\_\_\_\_  
Regional Fire Management Coordinator

Date: \_\_\_\_\_

Approved by: \_\_\_\_\_  
California/Nevada Operations Manager

Date: \_\_\_\_\_